

DIPTERA OF AUSTRALIA.

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PART V.—THE CULICIDÆ.

(PLATE XL.)

The Australian species of this family are numerous, but like the other small Diptera of the country have never been much noticed. Up to the present time nine species of *Culex* and one of *Anopheles* are recorded. Of the former I regard *C. camptorhynchus*, Thomson, as synonymous with *C. alboannulatus*, Macquart; and *C. timendus*, Walker, recorded in that author's "Notes on Diptera and lists of Species (1874)," appears to me to have been named only, for I have looked for it in vain amongst his published descriptions. In the present paper one species of *Megarrhina*, thirteen of *Culex*, four of *Anopheles*, and one of *Aedes* are described as new, while one species of *Culex*, which is wide-spread in the country, is dubiously regarded as an introduced species, the total amounting to twenty-eight. There are beyond doubt many more species yet to be discovered, and it is not at all certain that even all those prevalent in the neighbourhood of Sydney are completely exhausted, more particularly as a new well-marked species was found here just before the completion of the present contribution.

A few years since the Hon. William Macleay named, and drew up descriptions of, a few of the species represented in his collection; these names I have in all cases retained.

The Culicidæ constitute the second family of the sub-division Polyneura, and are divided into two sub-families, the CULICINA (including *Megarrhina*, *Culex*, *Anopheles*, and *Aedes*), and the CORETHRINA (including *Corethra* and *Mochlonyx*). *Sabethes* and *Psorophora*, both established by R. Desvoidy, are regarded as

synonymous with *Culex*, while *Plettusa*, a genus formed by Philippi (V. z-b. G. Wien, 1865, p. 597, taf. XXIII, fig. 2) for the reception of some South American insects which that author referred to this family, is regarded by Baron Osten-Sacken as identical with *Geranomyia* of the Tipulidæ (Mon. Dipt. N. America, Part IV., Tipulidæ, 1869, p. 79).

These insects have a cosmopolitan range; only *Mochlonyx*, with two or three species, appears at present to be confined to Europe, but it has possibly been overlooked in other countries. The brilliant species belonging to *Megarrhina*, although few in number, are widely scattered, being represented in North and South America, the West Indies, North and South Asia, the Eastern Isles, and in Australia. The typical genus *Culex*, comprising the true mosquitoes, has a world-wide dissemination, and includes some 160 described species; in Europe from extreme north to south about 30 species are known, and the same number are recorded from both North and South America, of which one species, *C. annulatus*, is common to the former two continents; two species stand recorded from Mexico and an equal number from the West Indies. In Southern Asia and the Eastern Isles about 25 species are known to occur, eleven have been named from Africa, four have been discovered in New Zealand, and in the present contribution no less than 21 are recorded for Australia. One species appears to have been introduced into this country, judging from the accounts of old colonists, and is possibly a variety of *C. ciliaris*, Linn. It may have been imported from Europe in the water-tanks belonging to some of the old sailing vessels. As the railway lines extend so this mosquito reaches portions of the country often hitherto exempt from it, and it has been, and is being, communicated to other places along the coasts by water traffic. Certain descriptions in Meigen's and Macquart's works fit this species fairly well as far as they go, but are much too brief and unsatisfactory to be of much service for conclusive identification; and none of the more modern works giving descriptions of Culicidæ being available to me, I have been compelled to simply give the description of this species without

attaching any name, in the hope that some foreign Dipterologist may be able to identify it. It is *par excellence* the domestic nocturnal pest of all the Australian colonies, rivalling its other wingless co-operators in bloodthirstiness. To residents who have been in the country a considerable time, the dreary hum of this evil genius of the sleeping-chamber is generally considered more troublesome than its operation of phlebotomy, while to a newcomer the inflammation caused by the latter is accompanied with extreme irritation.

The genus *Anopheles*, although numbering but few species,—less than thirty,—is widely diffused. Five species are prevalent in Europe, seven in North America of which latter no less than three are common to it and Europe, one in the West Indies, at least four occur in South America, two in Southern Asia and the Eastern Isles, and lastly five is the small and undoubtedly unrepresentative total of Australian species. The genus *Aedes* seems very limited in numbers; two species are found in Europe, the same in North America, and one is now described from Australia.

Of the remaining two genera belonging to the sub-family CORETHRINA, very little is known out of Europe; *Corethra* has two known species in North and one in South America, and about eight species appear on the European list. *Mochlonyx*, as already mentioned, seems to be restricted to two or three species, all of which are European.

The habits and young stages of the gnats or mosquitoes are so well known that it is needless for me to recount them here. The perfect insects occur about Sydney all the year round, but very abundantly during the summer months; certain species conceal themselves during the day, coming out in myriads in the evening, and returning to some suitable retreat again before daybreak; others are day-fliers and cause much annoyance to travellers in the bush, especially as they sometimes appear in dense clouds. Many species may be obtained by disturbing bushes, others are commonly found in caves, hollow trees, &c., of course more particularly

those situated in close vicinity to stagnant water and marshy places, where the insects may be frequently observed drinking.

I must take this opportunity of gratefully acknowledging the assistance derived from the Hon. William Macleay's MSS., which were freely handed to me for my use; also the help from Drs. J. and T. L. Bancroft and Mr. Henry Tryon, of Brisbane; Mr. A. G. Hamilton, of Mt. Kembla, Illawarra; Mr. De Meyrick, of Penrith; and Mr. George Masters, in obtaining for me valuable material for description.

Genus 1. MEGARRHINA, Desv.

Megarrhina, Desvoidy, Essai sur les Culicides, Mém. Soc. d'Hist. Nat. de Paris, III. 1827, p. 412; Macquart, Diptères Exotiques, Vol. I. 1838, p. 32, pl. 1, fig. 1.

Proboscis bent downwards about the middle of its length; in the ♂ almost the length of the body, in the ♀ a little shorter. Palpi in the ♂ a little longer than the proboscis; first joint short; second, third, and fourth elongate, cylindrical, of equal length except the second, which is a little shorter; in the ♀ of rather less length than the proboscis, with five cylindrical joints of nearly equal length. Antennæ in the ♂ with bushy plumes, the second joint a little elongate; in the ♀ the joints elongate, with a few long hairs at the base. Prothorax projecting from each side in the form of a scale; bordered with hairs in the ♂, naked in the ♀. Abdomen: the last three segments bordered laterally with hairs in the ♂, the copulatory organ accompanied by two appendages terminating in a point. Wings: first marginal cell very small; transverse veins very remote from the petiolated cells.

Obs.—The above is derived partly from Macquart's synoptical table on p. 29, and partly from the additional characters enumerated by him on p. 32, drawn from the sexes of *M. hæmorrhoidalis*, the type of this genus. I would add the following observations with reference to the species hereafter described, more particularly as it does not correspond in every particular with Macquart's description or figure.

Head small, subglobose, free from the thorax. Eyes lunular, emarginate at the insertion of the antennæ, more closely approximate above in the ♀ than in the ♂. Palpi* in the ♂ a little shorter than the proboscis, densely clothed with scales, six-jointed; the first two joints very short, the third, fourth, and fifth elongate, cylindrical, the fifth somewhat longer than the third and the fourth somewhat longer than the fifth, the sixth joint nearly twice the length of the fifth, acuminate. Proboscis in both sexes equal in length to the abdomen and half the thorax, densely clothed with scales. Antennæ 2- + 12-jointed. Thorax ovate, much more pointed anteriorly than in *Culex*; prothoracic lobes bordered with hairs in both sexes; scutellum more oblong than in *Culex*. Abdomen flattened, sub-claviform, with eight segments, the last three segments in both sexes densely bordered laterally with long hairs. Legs long, slender, minutely spinulose; coxæ short. Wings longer than the abdomen, incumbent in repose; auxiliary, first longitudinal, and basal half of the fifth longitudinal vein densely covered with more or less turbinate scales. Humeral cross-vein and sub-costal cross-vein present, the latter situated at the middle of the auxiliary vein. Marginal cross-vein present, the second longitudinal vein appearing before it in the first basal cell in an ill-defined manner, like an incrassation of a wing-fold. Second longitudinal terminating in a very small short fork, with a cuneiformly narrowed base, both branches bent slightly anteriorly at their extreme tips in the ♂. Third longitudinal vein not originating from the second longitudinal vein, joined to it by a supernumerary cross-vein, and starting at the middle cross-vein, which is situated much before the latter and exactly opposite the posterior cross-vein. † Fourth longitudinal vein with a long fork,

*The palpi and antennæ of the only specimen of the ♀ I have seen are broken off near the base.

†In both sexes the third longitudinal vein appears to traverse the first posterior cell to its base as a very indistinct incrassation of a wing-fold, but in the specimen of the ♀ before me the third longitudinal is covered with scales for some distance before the middle cross-vein.

cuneiformly narrowed towards the base, the anterior branch slightly bent posteriorly at its extreme tip in the ♂. Fork of the fifth longitudinal vein very long, its base situated some distance before the sub-costal cross-vein. Sixth longitudinal vein somewhat sinuous, joining the margin beyond the posterior cross-vein, in the ♀ opposite the supernumerary cross-vein (Pl. XL., fig. 1).

As far as I am aware only eight species of this very distinct genus have been hitherto described—one from North and another from South America, one from the West Indies, four from Southern Asia and the Eastern Isles, and one from Amur, Northern Asia.

191. MEGARRHINA SPECIOSA, sp.n. (W. Macleay, MSS.).

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♂.—Length of antennæ..... | 0·160 inch | ... | 4·06 millimètres. |
| Expans of wings..... | 0·330 × 0·060 | ... | 8·39 × 1·54 |
| Size of body | 0·440 × 0·080 | ... | 11·17 × 2·02 |

Antennæ brown, a little more than half the length of the palpi; basal joint black, with hoary reflections; second joint more than twice the length of the third, ornamented with some beautifully iridescent scales, the whorl of very long hairs situated about $\frac{1}{3}$ from the apex. Head covered with brilliant margaritaceous scales, chiefly reflecting green; in a certain light appearing brown with a bright pale greenish line round the hinder border of the eyes. Proboscis (0·300 in.) somewhat longer than the palpi (0·285 in.), deep metallic blue, with a purplish reflection before the bend, brown beyond. Palpi deep metallic blue, with purplish reflections, the third joint ringed with golden-yellow at the apex (this is much more distinct underneath), and the fourth joint with a broader ring of the same beyond the middle. Thorax brown, the lateral margins and prothorax densely covered with pale greenish scales, the latter with long brown hairs; hinder margin and scutellum richly adorned with brilliantly iridescent scales and long brown hairs; pleuræ with a naked brown stripe from the origin of the wings to the scale-like prothoracic projection, below this densely covered

with silvery scales; metanotum brown, naked. Halteres ochre-yellow. Abdomen about twice the length of, but narrower than, the thorax, flat, deep metallic blue, except the first segment, the latter green with a yellow patch on each side; fifth segment showing some golden-yellow laterally, sixth and eight segments ornamented with a strong tuft of golden hair laterally, the seventh with black tufts; all the segments slightly bordered with golden hairs laterally; the first to third and fifth to seventh segments golden-yellow beneath with a metallic blue longitudinal stripe down the centre, fourth entirely metallic blue, and the terminal one brilliant pale green. Coxæ clothed with silvery scales. Femora and tibiæ metallic violet, the former golden-yellow beneath. In the intermediate- and fore-legs (the hind legs wanting below the tibiæ in the specimen before me), the first joint of the tarsi white except at the base, and the second also except at the apex; the rest metallic violet. Wings longer than the abdomen, with a pale brownish tint anteriorly and along the fifth longitudinal vein, veins pale brown, cilia pale, and short; weak reflections. Auxiliary vein joining the costa almost opposite but somewhat beyond the tip of the posterior branch of the fifth longitudinal; sub-costal cross-vein distinct, situated about midway between the origin of the anterior branch of the fifth longitudinal vein and the origin of the second longitudinal; fork of the latter very small, the tips of the branches slightly bent anteriorly; supernumerary cross-vein equal in length to the middle cross-vein; posterior cross-vein more than twice the length of the latter, rather sinuose; tip of the anterior branch of the fifth longitudinal vein joining the margin opposite the middle of the second posterior cell; a very prominent wing-fold running close to the posterior side of the fifth longitudinal for the whole of its length and another on the anterior side in the anal cell.

Hab.—Port Denison, Queensland (Masters).

Obs.—The above is taken from a single ♂ specimen whose hind-legs are lost beyond the tibiæ, and whose thorax is perhaps partly denuded. There is also a ♀ specimen in the Macleay collection taken by Mr. Masters about twenty years ago near Sydney; it

seems to me to belong to this species, but is too abraded to satisfactorily decide. I do not know of any other captures of specimens of this genus in Australia, and I have never yet had the fortune to see a living example of these evidently scarce, and extremely magnificent insects.

Genus 2. *CULEX*, Linn.

Culex, Linnæus, Syst. Nat. 1735 ; Fauna Suecica, 1761 ; Geoffroy, Hist. n. Ins. 1764 ; Fabricius, Gen. Ins. 1776, p. 203 ; Ent. Syst. 1794 ; Latreille, Gen. Cr. et Ins. IV. 1809, p. 246 ; Meigen, Syst. Besch. i. 1818, p. 1 ; Macquart, S. à B. I. 1834, p. 33 ; Curtis, Brit. Ent. Vol. XII. 1835, p. 537 ; Zetterstedt, D.Sc. 1850 ; Walker, I. B. III. 1856, p. 243 ; Schiner, F.A. II. 1864.

Head small, almost globose, situated moderately deep in the thorax. Eyes lunular, emarginate at the insertion of the antennæ, approximate above. Ocelli wanting. Palpi porrected, clothed with scales ; longer* than the antennæ in the ♂, six-jointed, the last three joints hairy ; first two joints short, third long and slender, fourth the longest, clavate, fifth and sixth about equal length, the fifth longer than the sixth or the latter longer than the fifth ; in the ♀ very short, five-jointed ; first joint rather longer than the second, membranous at the base, second small, third clavate, fourth longest and stoutest, fifth extremely small, nipple-shaped or gemmiform. Proboscis long, slender, densely clothed with scales, straight or a little bent. Antennæ porrected, about the length of the thorax, shorter than the proboscis, 2- + 12-jointed, first joint of the scapus large and globose ; in the ♂ second rather longer and stouter than the first flagellar joint, whorled with very long hair towards the apex ; the ten following flagellar joints short, fusiform, whorled in the middle with very long hair, the penultimate joint greatly elongated beyond the whorl, terminal joint long, shorter than the last, slender like the continuation of the last, with a few moderately

*Meigen, Macquart and Curtis all say "longer than the proboscis" in the ♂, but I do not find this to be the case in every species.

long hairs forming a verticil at the base, clothed with short hairs; in the ♀ the second joint of the scapus stouter and rather longer than the following joints, sparsely verticillate-pilose; flagellar joints gradually increasing in length, slender, cylindrical, rather densely covered with a short pubescence, sparsely verticillate-pilose at the base. Thorax longish-ovate, arched; scutellum small; metathorax steep. Halteres small. Abdomen slender, almost cylindrical, with eight segments in both sexes; in the male terminating with holding-forceps; the ovipositor of the ♀ with short terminal lamellæ. Legs long and slender, especially the hind pair; coxæ short; tibiæ spinulose; tarsi long, metatarsal joint very long, terminal joint shortest in the hind-legs; ungues small, acute. Wings longer than the abdomen, narrow, elongate, lanceolate, densely ciliated, the veins covered with chiefly linear scales; incumbent in repose. Humeral cross-vein and sub-costal cross-vein present, the latter situated before the middle of the auxiliary vein. Marginal cross-vein wanting. Second longitudinal vein starting from the first longitudinal vein a short distance beyond the sub-costal cross-vein, and at a point before half the length of the wing, terminating in a long narrow fork, the branches running parallel. Third longitudinal vein originating from the second longitudinal at a point much nearer to the base of the fork than to the origin of the latter. Middle cross-vein situated close to the base of the third longitudinal vein. Fourth longitudinal vein terminating in a broader and rather shorter fork than that of the second longitudinal; their bases more or less opposite. Posterior cross-vein situated more or less before, or almost in a line with, the middle cross-vein. Fork of the fifth longitudinal nearly as broad as that of the second and fourth longitudinal veins taken together, as long or a little longer than that of the former, its base generally situated at a point about mid-way between the base of the second longitudinal and the tip of the sixth longitudinal, sometimes beyond. Sixth longitudinal vein slightly arcuated, joining the wing margin before the posterior cross-vein (Pl. XL, fig. 2).

A. TARSAL JOINTS WITH PALE RINGS.

192. *CULEX ALTERNANS*, Westwood.

Culex alternans, Westw. Ann. Soc. Entom. France, Vol. IV. 1835, p. 681; Trans. Ent. Soc. London. Part III. 1881, p. 384.

Pale brownish; abdomen ringed with white; wings hyaline; veins, especially the costal, reddish, adorned with brown scales except in the stigmatic region, where white scales appear, with others with black and white arranged alternately; legs reddish, with brown scales; femora before the apex, towards the tibiæ and behind the middle, with the genua and tarsi ringed with white. Length of the body (probosc. excl.) 4 lines; expanse of the wings 8 lines.

Hab.—New Holland. Hopean Mus. Oxford.

193. *CULEX HISPIDOSUS*, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♂.—Length of antennæ..... | 0·120 inch | ... | 3·04 millimètres. |
| Expanse of wings..... | 0·240 × 0·045 | ... | 6·09 × 1·13 |
| Size of body..... | 0·300 × 0·045 | ... | 7·62 × 1·13 |

Antennæ pale ochre-yellow, the verticils sericeous, almost hoary at the tip when viewed in a certain light, not quite $\frac{2}{3}$ the length of the palpi; joints of the scapus more or less covered with white scales. Head adorned with a mixture of erect yellow and white scales and long yellow hairs; the eyes bordered with a compact line of white decumbent scales. Proboscis pale ochre-yellow, brown at the base and black at the extremity, about $\frac{5}{8}$ the length of the palpi. Palpi pale ochre-yellow, imperfectly covered with white scales, the first two joints and tips of the remaining joints with brown scales, hairs pale ochre-yellow, sericeous; sixth joint considerably longer than the fifth. Thorax densely covered with scales, some very long and almost erect, appearing grey to the naked eye, but under a lens proving to be chiefly white scales variegated with indistinct longitudinal stripes and patches of very pale yellow scales, the whole interspersed with long yellow hairs; a roundish patch of yellow scales under each humerus, a narrow

median longitudinal stripe appearing only to reach the middle of the thorax, and lastly a short lateral stripe beginning opposite the termination of the median one, underneath each humeral patch, and extending to the scutellum (in a certain light these short stripes appear to form a fork with the median stripe); pleuræ ochraceous-brown, almost covered with white decumbent scales; scutellum adorned with long white scales and very long yellow hairs; metanotum ochraceous-brown, almost hoary when viewed at a certain obliquity. Halteres pale ochre-yellow. Abdomen whitish, two and a half times the length of the thorax, densely clothed with long white decumbent and erect scales and long yellow hairs, each segment bordered posteriorly with a broad band of pale yellow, in the last two or three segments apparently represented by two lateral patches; beneath covered with white decumbent scales, the segments posteriorly bordered with bicoloured scales, the basal half of each being pale yellow and the apical portion umber-brown; forceps densely covered with scales and long yellow hairs, basal joints brown, the terminal hooks yellow, very long and incurved. Legs pale ochre-yellow, densely covered with long semi-erect scales interspersed with long yellow hairs, making them appear more than twice their real thickness; coxæ brownish-ochraceous, more or less covered with white scales, the remaining joints ringed with white and bicoloured scales alternately, the colours of the latter as on the abdomen; the dark rings on the femora and tibiæ much broader than the white ones, both about equal width, or the latter somewhat wider, on the tarsi. Wings about the length of the abdomen, hyaline, veins yellow covered with a mixture of white and bicoloured scales (similarly coloured to the above-mentioned), the marginal cilia in grey and white patches alternately; rather weakly iridescent. Auxiliary vein joining the costa opposite the tip of the posterior branch of the fifth longitudinal vein; sub-costal cross-vein much nearer the origin of the second longitudinal vein than to the humeral cross-vein; middle cross-vein a little shorter than the posterior cross-vein, almost in line with one another, situated over the middle of the posterior branch of the

fifth longitudinal vein; both these cross-veins and the base of the second longitudinal slightly clouded with pale fuscous; anterior branch of the fifth longitudinal vein originating a little before the tip of the sixth longitudinal, and its tip joining the posterior border opposite the base of the second posterior cell; second posterior cell somewhat wider than the first sub-marginal cell, and half its length.

Hab.—Hexham Swamps, near Newcastle and Richmond (Skuse), Mt. Kemplla, Illawarra, N.S.W. (Mr. A. G. Hamilton). January.

Obs.—This is a day-flying bush mosquito, and is by far the most beautiful and most distinct of all the Australian species of *Culex* known by me. It is strange that I have not taken a specimen of the ♀, more particularly as the latter sex usually requires the least looking for. The species has long been known in various parts of New South Wales under the name of “Hexham grey.”*

194. CULEX VITTIGER, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♀.—Length of antennæ..... | 0·100 inch | ... | 2·54 millimètres. |
| Expansé of wings..... | 0·220 × 0·050 | ... | 5·58 × 1·27 |
| Size of body..... | 0·240 × 0·045 | ... | 6·09 × 1·13 |

Antennæ brown, nearly $\frac{2}{3}$ the length of the proboscis; first joint of the scapus and basal half of the second, ochraceous. Head densely clothed with yellow scales and hairs. Proboscis brown at the base, ochraceous towards the middle, dusky towards the tip, rather more than four times the length of the palpi. Palpi ochraceous, tip of the fifth and last joint dusky, densely covered with rather long hairs. Thorax black, with five vittæ of whitish scales, the median one furcate a short distance before the

* Since the above was written I have been fortunate enough to receive specimens of the ♀ from Queensland through the kindness of Mr. Henry Tryon of Brisbane, who obtained them for me at Breakfast Creek. It is there called the “Scotch-grey.” The ♀ possesses very long palpi, these being rather more than half the length of the proboscis.

scutellum, its branches coalescent with the next lateral vittæ: all the vittæ are equidistant and all beset with long golden-yellow hairs posteriorly; the outside ones on the lateral margin rather wider than the rest, joining the next before reaching the anterior margin; pleuræ with some large patches of white scales; scutellum densely covered with white scales and long golden-yellow hairs. Halteres yellow. Abdomen twice the length of the thorax, densely clothed with whitish scales; terminated with two small elongate deep brown lamellæ. Legs rather robust. Coxæ brown, with white scales. Femora, tibiæ and tarsi pale ochre-yellow, every joint tipped with black. Wings hyaline, veins yellowish-brown, cilia pale, sericeous; brilliant margaritaceous reflections. Auxiliary vein joining the costa before the tip of the anterior branch of the fifth longitudinal vein; sub-costal cross-vein situated nearer the base of the second longitudinal than to the humeral cross-vein; middle cross-vein considerably longer than the posterior cross-vein, the former situated a little in advance of the latter, both very little before the tip of the posterior branch of the fifth longitudinal; anterior branch of the latter originating a little before the tip of the sixth longitudinal vein, and joining the margin opposite the base of the second posterior cell.

Hab.—Port Denison and Wide Bay, Queensland (Masters); Gosford, N.S.W. (Skuse). February.

Obs—Probably occupying the brush country all along the east coast.

195. *CULEX OCCIDENTALIS*, sp.n. (W. Macleay, MSS.)

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♀.—Length of antennæ..... | 0·090 inch | ... | 2·27 millimètres. |
| Expansive of wings..... | 0·200 × 0·050 | ... | 5·08 × 1·27 |
| Size of body..... | 0·200 × 0·040 | ... | 5·08 × 1·01 |

Antennæ almost cinereous, about $\frac{4}{5}$ the length of the proboscis; the first joint of the scapus and basal half of the second ochraceous. Eyes bordered behind with a narrow line of golden-yellow scales,

followed by a band of deep reddish-brown, the back of the head densely covered with golden-yellow scales. Proboscis six times the length of the palpi, brown, darker at the base and towards the extremity. Palpi dusky brown, the fourth joint with a small ring of white at the base, and the terminal joint white. Thorax deep reddish-brown (when denuded), densely covered with golden-yellow scales, pleuræ reddish-brown, mottled with several patches of whitish scales; scutellum testaceous, with golden-yellow scales and long brown setæ; metanotum reddish-brown. Halteres with the club dusky-brown, stem ochre-yellow. Abdomen twice the length and not quite the width of the thorax, dark brown, each segment with a narrow band of whitish anteriorly, and fringed with long golden-yellow hairs; beneath covered with whitish scales, the segments bordered posteriorly with a narrow band of brown. Legs dark brown; the coxæ and basal half of the femora more or less dusted with whitish or yellowish scales, the apex of latter slightly tipped with white; also first, second, and third joints of the tarsi ringed with white at the base. In the hind-legs the tibiæ about $\frac{1}{3}$ longer than the metatarsi. Wings longer than the abdomen, hyaline, the veins thickly covered with long, slender, brown scales, cilia grey; brilliant reflections. Auxiliary vein reaching the costa opposite the tip of the posterior branch of the fifth longitudinal vein; sub-costal cross-vein situated a short distance before the origin of the second longitudinal vein; middle cross-vein almost imperceptibly longer than the posterior cross-vein, the former situated in front of the latter a distance equal to its length; first sub-marginal cell considerably longer and narrower than the second posterior cell, its base being almost opposite, but slightly before the base of the latter; anterior branch of the fifth longitudinal vein originating opposite a point nearer the tip of the sixth longitudinal vein than the base of the second longitudinal, and joining the margin opposite the middle of the second posterior cell.

Hab.—King George's Sound, Western Australia (Masters). A single specimen.

196. CULEX VIGILAX, sp.n.

| | | | |
|----------------------------|---------------|-----|-------------------|
| ♀.— Length of antennæ..... | 0·090 inch | ... | 2·27 millimètres. |
| Expansé of wings..... | 0·170 × 0·050 | ... | 4·31 × 1·27 |
| Size of body..... | 0·200 × 0·045 | ... | 5·08 × 1·13 |

Antennæ dark brown, $\frac{3}{4}$ the length of the proboscis; joints of the scapus more or less ochraceous-brown or ochraceous. Head covered with dark brown scales, indistinctly mottled with yellow scales. Proboscis about seven times the length of the palpi, very dark brown or black, ochreous-yellow beneath from just beyond the base to a little beyond the middle. Palpi dark brown, the last joint with white scales at the apex. Thorax very deep brown or black, densely covered with deep brown or black scales, mottled with small patches of golden-yellow scales; pleuræ very deep brown, spotted with a few small patches of white scales; scutellum deep brown, sometimes tinged with testaceous, with golden-yellow scales and setæ; metanotum deep brown, nearly black, more or less testaceous at the sides. Halteres entirely ochre-yellow. Abdomen scarcely twice the length of the thorax, covered with violet-black scales, each segment except the first bordered anteriorly with a narrow band of very pale yellowish or whitish scales, the first segment set with numerous golden-yellow setæ and sprinkled with white scales; all segments with a small patch of pure white scales laterally below the extremities of the anterior bands; venter covered with very pale yellowish or whitish scales; lamellæ of the ovipositor deep brown. Coxæ light brown, with white scales. Femora violet-black above and at the apex, sprinkled with yellowish or whitish, beneath yellowish or whitish, nearly wholly violet-black in the fore-legs; genua bright golden-yellow. Tibiæ violet-black, sprinkled with yellowish scales. Tarsi violet-black, each joint with a narrow ring of white at the base, rather indistinct on the last two joints of the fore- and intermediate-legs. In the hind-legs the metatarsus rather more than $\frac{2}{3}$ the length of the tibiæ. Wings longer than the abdomen, hyaline, with a pale yellowish tint anteriorly, veins covered with slender brown scales, cilia grey; rather brilliant reflections. Auxiliary vein joining the costa a little

before the posterior branch of the fifth longitudinal fork; middle cross-vein longer than the posterior cross-vein, situated a short distance in front of the former; first sub-marginal cell somewhat longer and slightly narrower than the second posterior cell, the base of the former situated a little beyond the base of the latter; anterior branch of the fifth longitudinal vein originating opposite a point about mid-way between the origin of the second longitudinal and the tip of the sixth longitudinal vein, joining the posterior border opposite the middle of the second posterior cell.

Hab.—Gosford, Kiama, and National Park, N.S.W. (Skuse); Brisbane, Queensland (Dr. J. Bancroft and Mr. H. Tryon). November to February.

197. *CULEX ALBOANNULATUS*, Macquart.

Culex alboannulatus, Macq., *Diptères Exotiques*, 4th Suppl. 1850, p. 10; *C. camptorhynchus*, Thomson, *Kongliga Svenska Fregatten Eugénies Resa omkring Jorden*, Zool. Diptera, 1868. p. 443.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♂.—Length of antennæ..... | 0·080 inch | ... | 2·02 millimètres. |
| Expanse of wings..... | 0·165 × 0·035 | ... | 4·18 × 0·88 |
| Size of body..... | 0·210 × 0·035 | ... | 5·33 × 0·88 |
| ♀.—Length of antennæ..... | 0·085 inch | ... | 2·14 millimètres. |
| Expanse of wings..... | 0·170 × 0·040 | ... | 4·31 × 1·01 |
| Size of body..... | 0·210 × 0·040 | ... | 5·33 × 1·01 |

♂ and ♀.—Antennæ in the ♂ light brown, the hairs pale brown sericeous, a little more than $\frac{2}{3}$ the length of the palpi; the first joint of the scapus black; in the ♀ dusky brown, $\frac{3}{4}$ the length of the proboscis, the joints of the scapus testaceous. Head brown, more or less covered with golden-yellow and white scales, sometimes with patches of brown, generally with a small patch of white on each side; sparingly pilose. Proboscis in the ♂ somewhat longer

than in the ♀, six times the length of the palpi; generally black or deep brown, sometimes a little whitish or yellowish beneath at middle. Palpi black or deep brown; in the ♂ the last four joints ringed with white at the base, in the ♀ the fourth joint with a slight ring of white at the base and the minute terminal joint entirely white. Thorax very deep fuscous or reddish-brown (when denuded), densely covered with dish-brown (when denuded), densely covered with traversed by five very fine often very indistinct naked lines, which are made somewhat more prominent by white scales which give the thorax a silky appearance:—a median longitudinal line, never bordered with pale scales, terminating before the scutellum in an almost triangular bare space marked with two very small patches of white scales anteriorly and one near each corner at the base; a short oblique line at the humeri and a lateral, almost hooked-shaped, one running from the scutellum for rather more than half the length of the thorax then turning towards the lateral margin, both bordered by a slight line of white scales and the last with a small patch of white at the beginning of the bend in front; a larger more or less distinct, indeterminable patch above the origin of the wings; pleuræ fuscous or reddish-brown, marbled with small patches of white scales; some brown hairs about the origin of the wings; scutellum dark brown or testaceous-brown, adorned with three patches of white scales, and fringed with long brown hairs; metanotum brown. Halteres fuscous-brown, the stem often entirely testaceous. Abdomen in the ♂ more than twice the length of the thorax, in the ♀ about twice the length; black or deep brown, with an olivaceous tinge; in the ♂ each segment very distinctly bordered anteriorly with a narrow band of white, in the ♀ this border is very slight, sometimes only occurring in the middle of the anterior margin, or entirely absent, generally with a distinct white spot laterally on each; the segments densely fringed posteriorly and laterally with pale yellowish hairs more dense and stiff in the ♂ than in the ♀, particularly at the sides; venter more or less covered with white scales; ♂ forceps and lamellæ of the ♀



ovipositor deep brown. Coxæ brown or fuscous, with white scales and pale yellow hairs. Femora in the ♂ covered with violet-black scales, more or less spotted with pale yellowish or whitish scales, especially at the base and beneath, and slightly tipped with yellow or white at the apex; in the ♀ usually pale yellowish or whitish for $\frac{2}{3}$ of their length, violet-black for the remaining third, and more or less so along the upper side, usually with a distinct ring of white before the extremity, the extreme tip and genu always slightly yellow or white. Tibiæ and tarsi violet-black or violet-brown, the former fringed with erect hairs, the latter in the fore- and intermediate-legs with the first three joints very slightly ringed with white at the base, in the hind-legs the first four, and in the ♂ sometimes all the joints, with a broad white ring at the base. In the hind-legs the tibiæ about $\frac{1}{2}$ longer than the metatarsi. Wings the length of the abdomen in the ♂, longer and wider in the ♀, hyaline, the veins covered with dark fuscous-brown scales, cilia greyish. Auxiliary vein reaching the border opposite the tip of the posterior branch of the fork of the fifth longitudinal vein; middle cross-vein rather longer than the posterior cross-vein, situated beyond the latter a distance equal to its length; first sub-marginal cell rather longer and much narrower than the second posterior cell, its base lying somewhat beyond that of the latter; anterior branch of the fifth longitudinal vein as in the last species.

Hab.—New Holland, eastern coast (Macquart); Sydney (Thomson), common, also Woronora and Blue Mountains, N.S.W. (Masters and Skuse). October to January.

Obs.—This species seems variable in the intensity of its colouring, while in old specimens the five thoracic lines are frequently not distinguishable. The above description is drawn from a large series of fresh specimens. I have no doubt in my mind about the identification and synonymy of the insect.

Macquart points out that this species approaches *C. annulatus*. It differs principally, however, in the markings of the thorax, in the lack of spots on the wings, and in its smaller size. Thomson

seems to lay some importance on the "curved proboscis" through which he compares this species with *C. toxorhynchus*, but it cannot be regarded as structural, for I find straight and curved probosces in both sexes of this and other species.

198. *CULEX RUBRITHORAX*, Macquart.

Culex rubrithorax, Macq., Diptères Exotiques, 4th Suppl. 1850, p. 9.

"♀. *Thorace testaceo. Abdomine nigro, incisuris albidis. Pedibus flavidis; tarsi fuscis albo-annulatis.*"

Proboscis tawny, black at the base and extremity, sometimes entirely black. Palpi black, tawny at the base. Front brown, with a grey pubescence. Antennæ black. Thorax reddish-testaceous (denuded). Abdomen black, more or less shining, with a greyish-white pubescence about the incisions. Legs rather pale tawny; posterior femora sometimes black within their posterior third; posterior tibiæ brownish-black; tarsi black, sometimes yellowish; the first three joints with a white ring at the base, narrow and sometimes indistinct to the anterior and intermediate pairs, large to the posterior. Wings rather limpid; veins normal, covered with small black hairs.

Five ♂ specimens, of which one has the tarsal rings nearly absent.

Tasmania. Long. $2\frac{1}{2}$ lines.

199. *CULEX FLAVIFRONS*, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♂.—Length of antennæ..... | 0·070 inch | ... | 1·77 millimètres. |
| Expanse of wings..... | 0·160 × 0·040 | ... | 4·06 × 1·01 |
| Size of body..... | 0·200 × 0·035 | ... | 5·08 × 0·88 |
| ♀.—Length of antennæ..... | 0·090 inch | ... | 2·27 millimètres. |
| Expanse of wings..... | 0·160 × 0·045 | ... | 4·06 × 1·13 |
| Size of body..... | 0·180 × 0·040 | ... | 4·56 × 1·01 |

♂ and ♀.—Antennæ in the ♂ light ochreous-brown, sericeous, about $\frac{2}{3}$ the length of the palpi; first joint of the scapus dusky-brown; in the ♀ dusky-brown, nearly the length of the proboscis; both joints of the scapus ochraceous-brown. Head densely covered with pale golden-yellow scales. Proboscis* dusky-brown, sometimes pale ochre-yellow towards the middle; in the ♂ somewhat shorter than the palpi; in the ♀ about six times the length of the palpi. Palpi dusky-brown; in the ♂ the fifth joint with an indistinct narrow ring of white at the base, in the ♀ the terminal joint white. Thorax reddish-brown (when denuded), densely covered with pale golden-yellow scales; pleuræ reddish-brown, spotted with several small patches of white scales; scutellum densely covered with pale golden-yellow scales and setaceous hairs; metanotum light reddish- or testaceous-brown. Halteres with the stem pale ochraceous and the club somewhat infuscated. Abdomen twice the length of the thorax, covered with violet-black scales, each segment bordered anteriorly with a narrow band of white, densely fringed with golden-yellow hairs; venter covered with white scales; ♂ forceps deep brown, with dense long golden-yellow hairs; lamellæ of the ♀ ovipositor deep brown. Coxæ pale reddish-brown or testaceous, with white scales. Femora covered with violet-black or violet-brown scales above at the apex, thickly powdered with white scales, white or pale ochre-yellow beneath; genua bright yellow. Tibiæ and tarsi violet-black or violet-brown, the tibiæ and metatarsi more or less covered with whitish or pale ochre-yellow scales beneath, and all the joints of the tarsi (indistinctly in the fore and intermediate pairs) ringed with the same at the base. In the hind-legs the tibiæ about $\frac{1}{3}$ longer than the metatarsus. Wings longer than the abdomen, pellucid, almost hyaline, with an almost imperceptible brownish tint, darker at the stigmatic region, the veins densely covered with violet-brown scales sparingly intermixed with yellowish scales, cilia brownish-grey. Auxiliary vein

*In one specimen the proboscis is almost wholly of a pale ochre-yellow colour.

reaching the costa opposite the tip of the posterior branch of the fork of the fifth longitudinal vein; middle cross-vein almost imperceptibly longer than the posterior cross-vein, situated beyond the latter a distance equal to rather more than half its length; first sub-marginal cell somewhat longer and distinctly narrower than the second posterior cell, its base lying slightly beyond that of the latter; anterior branch of the fifth longitudinal vein originating at a point about mid-way between the origin of the second longitudinal and the tip of the sixth longitudinal, joining the margin opposite the middle of the second posterior cell.

Hab.—Blue Mountains, N.S.W. (Masters); Victoria Park, Brisbane, one specimen (Mr. H. Tryon). November to January.

200. *CULEX ANNULIROSTRIS*, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♀.—Length of antennæ..... | 0·090 inch | ... | 2·27 millimètres. |
| Expanse of wings..... | 0·150 × 0·035 | ... | 3·81 × 0·88 |
| Size of body..... | 0·170 × 0·035 | ... | 4·31 × 0·88 |

Antennæ brown, the length of the proboscis; first joint of the scapus and basal half of the second joint testaceous. Head deep brown, nearly black, with yellow scales. Proboscis deep brown, nearly six times the length of the palpi, with a prominent broad ring of white in the middle one-third the length of the proboscis. Palpi black or deep brown, the third and last joints almost imperceptibly tipped with white. Thorax deep brown, rather densely covered with yellow scales and hairs; pleuræ deep brown, spotted with a few small patches of white scales; a little testaceous under the origin of the wings; scutellum somewhat testaceous-brown, with long yellow hairs; metanotum deep brown. Halteres brownish-ochraceous. Abdomen twice the length of the thorax, deep brown, nearly fuliginous; each segment bordered anteriorly with a narrow band of white scales and fringed posteriorly with golden-yellow hairs; underneath covered with white scales. Coxæ reddish-brown, with white scales. Femora deep brown above,

white beneath (in the fore- and intermediate- pairs the brown predominates), and just perceptibly white at the extreme apex; tibiæ and tarsi sordid brown, with a yellowish-grey reflection, all joints, except the last tarsal joint, with a small ring of white at the base. In the hind-legs the metatarsi equal in length to the tibiæ. Wings longer than the abdomen, hyaline, the veins thickly covered with brown scales, chiefly long and very slender, cilia brownish-grey. Auxiliary vein reaching the costa about opposite the tip of the posterior branch of the fifth longitudinal vein; middle and posterior cross-veins very pale, the former a little shorter than the latter and situated in front of it a distance equal to twice its length; first sub-marginal cell a little longer and distinctly narrower than the second posterior cell, its base situated almost opposite but slightly beyond the base of the latter; anterior branch of the fifth longitudinal vein as in the last species.

Hab.—Blue Mountains (Masters); Berowra, N.S.W. (Skuse).
January.

Obs.—I have seen only two specimens of this well-marked species.

201. *CULEX NOTOSCRIPATUS*, sp.n. (W. Macleay, MSS.).

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♂.—Length of antennæ..... | 0·070 inch | .. | 1·77 millimètres. |
| Expanse of wings..... | 0·140 × 0·030 | ... | 3·55 × 0·76 |
| Size of body..... | 0·160 × 0·030 | ... | 4·06 × 0·76 |
| ♀.—Length of antennæ..... | 0·085 inch | ... | 2·14 millimètres. |
| Expanse of wings..... | 0·160 × 0·040 | ... | 4·06 × 1·01 |
| Size of body..... | 0·180 × 0·035 | ... | 5·56 × 0·88 |

♂.—Antennæ light brown, verticils greyish-sericeous, about $\frac{7}{8}$ the length of the palpi; first joint of the scapus with a small patch of silvery-white scales on the inner side. Eyes olive-green, bordered behind with a fine line of silvery-white scales, followed by a broad band of black or very deep violet-black, behind which

is a patch of yellow scales. Proboscis as long as the palpi, violet-black, or very deep violet-brown, with a moderately broad ring of white just beyond the middle. Palpi brown, violet-black towards the apex, the last two joints ringed with white at the base. Thorax deep umber-brown, with a dense minute black pubescence, and marked with several fine longitudinal lines:—a median coming furcate before fork enclosing a space (scutellum) ; a short golden-line on each side of this, starting below the anterior border and terminating before the middle of the thorax; a lateral long sinuous silvery-white one, the anterior extremity very close to the median line, the posterior half little bent; lastly there is another short line of silvery-white above the wings, the anterior extremity of which does not reach the middle of the thorax; pleuræ, scutellum, and metanotum paler brown than the rest of the thorax, the first spotted with (generally eleven) small patches of silvery-white scales; scutellum bordered with a broad line of silvery-white scales, interrupted a short distance from each extremity; the interstices of the thoracic lines and the scutellum beset with long black hairs. Halteres pale, with some white scales. Abdomen twice the length of the thorax, deep violet-black or violet-brown, each segment bordered anteriorly with ochre-yellow scales and spotted laterally with a small patch of silvery-white scales; long golden-yellow hairs; beneath violet-black or violet-brown, each segment with a slight band of silvery-white scales anteriorly, the short terminal segment covered with silvery-white scales; holding forceps deep brown. Coxæ yellowish, with silvery-white scales and golden-yellow hairs. Femora, tibiæ, and tarsi violet-black, a silvery-white line along each side of the femora and tibiæ, and a ring of silvery-white at the base of all the joints of the tarsi of the hind-legs, and on the first and second joints of the tarsi in the fore- and intermediate legs. Wings about the length of the abdomen, pellucid, with a scarcely perceptible brownish tint, the veins densely



covered with narrow brown scales, cilia sericeous-grey, brilliant violet and purple reflections at a certain obliquity. Auxiliary vein joining the costa a short distance before the tip of the posterior branch of the fifth longitudinal vein; middle cross-vein equal in length to the posterior cross-vein, situated at a point in front of it a distance equal to twice its length, the latter opposite the middle of the posterior branch of the fifth longitudinal; first sub-marginal cell narrower and longer than the second posterior cell, its base lying opposite the base of the latter; anterior branch of the fifth longitudinal as in the last species.

Hab.—Sydney, and generally distributed in N.S.W. (Masters and Skuse). September to January.

Obs.—This is a very elegant and plentiful insect, occasionally coming into the house in the day time, and causing more painful wounds than any other mosquito known by me to occur in Sydney. A small variety is plentiful on the Blue Mountains. From December to March water butts and garden tanks swarm with the larvæ in all stages of their existence. In the hot summer weather the larvæ are hatched from the boat-like mass of (nearly three hundred) eggs in about twenty-four hours, and the perfect insects emerge in from three weeks to a month.

202. CULEX BANCROFTI, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♂.—Length of antennæ..... | 0·065 inch | ... | 1·66 millimètres. |
| Expans of wings | 0·100 × 0·023 | ... | 2·54 × 0·58 |
| Size of body..... | 0·140 × 0·030 | ... | 3·55 × 0·76 |

Antennæ very dark brown, the verticils black, about $\frac{3}{4}$ the length of the palpi; first joint of the scapus black, with silvery-white scales. Head deep brown, almost black (when denuded), covered with violet-black scales, with a very small patch of silvery-white on each side, some white or yellow scales in the middle, and a line of silvery-white bordering the eyes. Proboscis deep violet-black, as long as the palpi. Palpi deep violet-black, the four joints ringed at the base with silvery-white, the first two rings much broader than

the last two. Thorax very dark brown (when denuded), covered with brown scales, interspersed with some brown hairs, and traversed by four longitudinal silvery-white lines:—



the two median ones indistinct, parallel, stopping front of the scutellum, the middle, distinct, particularly much broader than the rest; extremely fine and rather at an oblong bare space in lateral ones bent at the the anterior half which is pleuræ very dark brown, spotted with numerous small patches of brilliant silvery-white scales; covered above with silvery-white scales; scutellum very dark brown, covered above with silvery-white scales and fringed with long brown hairs; dark brown. Halteres ochre-yellow. Abdomen a little more than twice the length of the thorax, densely clothed with violet-black scales, the second to sixth segments bordered anteriorly with a narrow band of white, those on the last three short and not reaching the lateral borders, each segment with a small patch of brilliant silvery-white scales at the sides; venter covered with yellowish and violet-black scales, the latter predominating; holding-forceps black or very deep brown, densely haired. Coxæ brown with silvery-white scales. Femora, tibiæ and tarsi covered with violet-black scales; the femora with white scales along the sides nearly to the tip and beneath on the basal half, the extreme apex silvery-white; the first two joints of the fore and intermediate, and all the joints of the hind tarsi, ringed with silvery-white at the base, those of the first two pairs of tarsi very slight. In the hind-legs, the tibia about $\frac{1}{3}$ longer than the metatarsus. Wings about the length of the abdomen, hyaline, the veins covered with violet-brown scales. Auxiliary vein reaching the costa opposite the cross-vein, and much before the tip of the posterior branch of the fork of the fifth longitudinal; middle cross-vein shorter than the posterior cross-vein, situated beyond it a distance a little greater than the length of the latter; first sub-marginal cell considerably longer and almost imperceptibly narrower than the second posterior cell, its base lying almost opposite that of the latter; anterior branch of the fifth longitudinal vein as in the last species.

Hab.—Brisbane, Queensland (Drs. J. and T. L. Bancroft).
Several specimens. December.

203. *CULEX PROCAX*, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♀.—Length of antennæ..... | 0·080 inch | ... | 2·02 millimètres. |
| Expanse of wings..... | 0·130 × 0·035 | ... | 3·30 × 0·88 |
| Size of body..... | 0·150 × 0·030 | ... | 3·81 × 0·76 |

Antennæ brown, nearly the length of the proboscis; first joint of the scapus bright ochraceous, second ochraceous at the base. Head light umber-brown, adorned with golden-yellow scales. Proboscis brownish-ochraceous, dusky at the tip, about nine times the length of the palpi. Palpi light umber-brown. Thorax reddish-brown, covered with golden-yellow scales; pleuræ reddish-brown, spotted with small patches of white scales; scutellum and metanotum reddish-brown, the former with golden-yellow scales and long hairs. Halteres ochraceous. Abdomen hardly twice the length of the thorax, black, each segment bordered anteriorly with a narrow band of white, and fringed posteriorly with golden-yellow hairs; venter covered with white scales; lamellæ of the ovipositor brown. Legs brown, the underside of the femora white, and the joints of the tarsi ringed with white at the base. In the hind-legs the tibia about $\frac{1}{4}$ longer than the metatarsus. Wings longer than the abdomen, pellucid, with a scarcely perceptible brownish tint, veins thickly covered with slender brown scales, cilia grey; brilliant reflections. Auxiliary vein joining the costa opposite or a little before the tip of the posterior branch of the fifth longitudinal; middle cross-vein somewhat longer than the posterior cross-vein, situated in front of the latter a distance about equal to its length; first submarginal cell a little longer and much narrower than the second posterior cell, its base situated exactly opposite that of the latter; anterior branch of the fifth longitudinal vein as in the last species.

Hab.—Gosford and South Clifton, N.S.W. (Skuse). December to February (?).

Obs.—A day-flying species.

B. TARSAL JOINTS WITHOUT PALE RINGS.

204. CULEX COMMOVENS, Walker.

Culex commovens, Walk., Insecta Saundersiana, Vol. I. Diptera, 1856, p. 432.

“♀.—*Fusca, robusta; proboscis testacea, supra apiceque nigricans; palpi testacei; antennæ testaceæ fasciis nigricantibus; thorax vittatus?; abdomen fulvo fasciatum; pedes fulvi, validi, femoribus tibiis et tarsorum articulis apice fuscescentibus; alæ limpidae, venis testaceis fusco notatis.*”

“Described from injured specimens. Brown, stout. Proboscis long, stout, straight, testaceous, blackish towards the base above and at the tip. Palpi testaceous, rather more than half the length of the proboscis. Antennæ testaceous, with very slender blackish bands, shorter than the *antennæ (!)* Thorax striped? Abdomen with tawny bands. Legs tawny, stout; tips of the femora, of the tibiæ and of the joints of the tarsi brownish. Wings limpid; veins testaceous, with some brownish marks. Length of the body 4 lines; of the wings 7 lines.”

“New Holland.”

205. CULEX AUSTRALIS, Erichson.

Culex australis, Erichs., Archiv für Naturg. Vol. VIII. 1842, p. 270.

“*Testaceus, thorace dorso fusco, abdomine nigro-fasciato, femoribus tibiisque summo apice pallidis.*”

Antennæ luteous. Proboscis somewhat elongate, palpi a little shorter than it in the ♂. Head fuscous-testaceous. Thorax fuscous on the back, testaceous at the pleure and below. Abdomen covered with a grey pilosity, segments pale at the base, black at the apex. Legs fuscous-testaceous, with the femora and tibiæ white at the extreme apex. Wings hyaline, veins testaceous, with the anterior ones fuscous-villose. Length of the body 3½ lines; of the proboscis 2 lines.

“*Hab.*—Tasmania.”

206. CULEX NIGRITHORAX, Macquart.

Culex nigrithorax, Macq., Diptères Exotiques, 2nd Suppl. 1847, p. 9.

“♂.—*Thorace nigro. Abdomine fusco incisuris albidis. Pedibus rufescentibus.*”

Proboscis black. Palpi and antennæ brownish. Thorax and pleuræ rather dull black. Abdomen with the anterior border of the segments yellowish-white; last segment and copulatory armature black; venter with whitish hairs. Legs rather bright tawny; extremity of the femora brownish; posterior tarsi brownish. Wings a little yellowish, with reddish veins; cells normal. Long. $3\frac{1}{2}$ lines.

Tasmania.

207. CULEX CRUCIANS, Walker.

Culex crucians, Walk., Insecta Saundersiana, Vol. I. Diptera, 1856, p. 432.

“♀.—*Fusca; proboscis fulva, apice fusca; antennæ nigrae, basi fulvæ; pectus fulvum; abdomen fasciis albedo-testaceis; coxæ et femora testacea; alæ subcinereæ, venis fuscis subciliatis basi testaceis; halteres testacei.*”

“Brown. Proboscis slender, straight, tawny, brown at the tip. Antennæ black, shorter than the proboscis, tawny at the base. Pectus tawny. Abdomen darker than the thorax, with a whitish testaceous band in front of each segment. Legs brown; coxæ and femora testaceous. Wings greyish; veins brown, slightly ciliated, testaceous at the base. Halteres testaceous. Length of the body $3\frac{1}{2}$ lines; of the wings 6 lines.

“Van Diemen’s Land.”

208. CULEX SAGAX, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♀.—Length of antennæ..... | 0·095 inch | ... | 2·39 millimètres. |
| Expand of wings..... | 0·170 × 0·050 | ... | 4·31 × 1·27 |
| Size of body | 0·200 × 0·040 | . | 5·08 × 1·01 |

Antennæ fuliginous, nearly the length of the proboscis; joints of the scapus more or less testaceous or ochraceous, with a few

white scales. Head deep brown densely covered with brown and golden-yellow scales and hairs. Proboscis black, rather more than five times the length of the palpi. Palpi black. Thorax deep brown or pitchy black (when denuded), densely covered with golden-yellow and whitish scales, which give it an almost sericeous appearance, traversed by three longitudinal rows of brown hairs, the lateral ones extending from the collare to the scutellum, the intermediate row terminating at an oblong bare space in front of the scutellum; pleuræ deep umber-brown, spotted with small patches of white scales; scutellum testaceous covered with whitish scales and long brown hairs; metanotum testaceous or testaceous-brown. Halteres ochre-yellow. Abdomen nearly twice the length of the thorax, each segment covered with violet-black scales bordered anteriorly with an undulate ochreous band; venter densely covered with pale ochreous scales; lamellæ of the ovipositor deep brown, elongate. Coxæ testaceous-brown, with white scales. Femora and tibiæ covered with violet-black scales more or less dusted with pale ochreous, the former pale ochreous beneath and slightly yellow at the extreme apex. Tarsi covered with violet-brown scales, having a peculiar ochreous reflection at a certain obliquity. In the hind-legs the tibia $\frac{1}{3}$ longer than the metatarsus. Wings nearly the length of the whole body, hyaline, the veins densely covered with violet-brown scales. Auxiliary vein joining the margin exactly opposite the tip of the posterior branch of the fifth longitudinal; middle cross-vein rather longer than the posterior cross-vein, situated in front at a distance equal to rather less than the length of the latter; first sub-marginal cell much narrower and scarcely longer than the second posterior cell, its base lying a little beyond that of the latter; anterior branch of the fifth longitudinal vein originating at a point nearer opposite the tip of the sixth longitudinal than to the origin of the second longitudinal, reaching the posterior border at a point opposite the middle of the second posterior cell.

Hab.—Murrumbidgee, N.S.W. (Prof. W. J. Stephens).

Obs.—A day-flying mosquito.

209. *CULEX MACLEAYI*, sp.n.

| | | | |
|----------------------------|---------------|-----|-------------------|
| ♀.- Length of antennæ..... | 0·095 inch | ... | 2·39 millimètres. |
| Expansé of wings..... | 0·170 × 0·050 | ... | 4·31 × 1·27 |
| Size of body..... | 0·190 × 0·040 | ... | 4·81 × 1·01 |

Antennæ fuliginous, about the length of the proboscis; first joint of the scapus and base of the second testaceous. Head deep brown, densely covered with golden-yellow scales, interspersed with a few brown hairs. Proboscis violet-brown, lighter in the middle, six times the length of the palpi. Palpi violet-brown. Thorax deep brown (when denuded), densely covered with golden-yellow scales and scattered brown hairs, traversed by two indistinctly traceable parallel longitudinal bare lines; pleuræ lighter brown than the thorax, spotted with a few small patches of white scales and golden-yellow hairs; scutellum and metanotum more or less testaceous-brown, the former covered with golden-yellow scales and long brown hairs. Halteres ochre-yellow. Abdomen twice the length of the thorax, deep umbrous-brown with an almost imperceptible violet reflection, each segment bordered anteriorly with a very narrow band of whitish or pale yellowish scales, densely fringed posteriorly and laterally with long pale golden-yellow hairs; venter densely covered with whitish or pale yellowish scales; lamellæ of the ovipositor light brown, densely pubescent. Coxæ ochraceous or testaceous, with white scales and golden-yellow hairs. Femora, tibiæ and tarsi covered with violet-brown scales, the undersides of the former two being covered with whitish or pale yellowish; in the hind-legs the tibiæ slightly tipped with whitish or pale yellowish. In the hind-legs the tibia and metatarsus of about equal length. Wings longer than the abdomen, hyaline, the veins densely covered with very long fine brown scales. Auxiliary vein joining the costa opposite the tip of the posterior branch of the fork of the fifth longitudinal; middle cross-vein shorter than the posterior cross-vein, situated in front of it a distance a little greater than the length of the latter; first sub-marginal cell scarcely narrower, but considerably longer, than

the second posterior cell, its base lying a short distance before that of the latter, and opposite the tip of the auxiliary vein; anterior branch of the fifth longitudinal vein originating opposite a point mid-way between the origin of the second longitudinal vein and the tip of the sixth longitudinal, reaching the posterior border opposite the middle of the second posterior cell.

Hab.—King George's Sound, Western Australia (Masters).
Two specimens.

210. *CULEX LINEALIS*, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♀.—Length of antennæ..... | 0·095 inch | ... | 2·39 millimètres. |
| Expanse of wings..... | 0·160 × 0·045 | ... | 4·06 × 1·13 |
| Size of body..... | 0·200 × 0·040 | ... | 5·08 × 1·01 |

Antennæ brown, about $\frac{5}{6}$ the length of the proboscis; first joint of the scapus dull reddish-brown, with yellow scales. Head brown, densely covered with golden-yellow scales and hairs. Proboscis uniformly covered with violet-black scales, about six times the length of the palpi. Palpi uniformly covered with violet-black scales. Thorax brown, with four distinct lines of golden-yellow scales, and densely bordered laterally with golden-yellow scales; interstices of the lines bare or nearly so; two median lines running parallel, and rather close together, from the anterior border for two-thirds the length of the thorax, at this point apparently coalescent, but proceeding to the scutellum is a slightly wider fork, the branches being parallel; the other two lines starting below the anterior border, running parallel, and continuing to the scutellum, and lying somewhat nearer to the median lines than to the lateral border of scales; pleuræ brown, with a few somewhat indistinct patches of white scales and a small tuft of moderately long white hairs under the origin of the wings; scutellum brown, with two lines of golden-yellow scales, coalescent at the apex, and appearing as a continuation of the two median lines of the thorax; beset with long golden-yellow hairs; metanotum brown. Halteres ochre-yellow. Abdomen not quite

twice the length of the thorax, superior segments covered with violet-black scales, each segment bordered anteriorly with a very narrow band of ochre-yellow; venter ochre-yellow, each segment bordered posteriorly with a moderately narrow band of violet-brown or violet-black. Coxæ and femora ochre-yellow, the latter more or less covered along the upper side and at the tip with violet-black scales, the extreme apex of the femora ochre-yellow; tibiæ and tarsi violet-black or violet-brown, the former with a more or less distinct line of ochre-yellow on the sides and slightly ochre-yellow at the extreme apex, and the first two joints of the tarsi very slightly and indistinctly ochre-yellow at the base. In the hind-legs the tibiæ about $\frac{1}{3}$ longer than the metatarsi. Wings longer than the abdomen, hyaline, the veins densely covered with violet-brown scales. Auxiliary vein joining the costa opposite the middle cross-vein and a little before the tip of the posterior branch of the fork of the fifth longitudinal; middle cross-vein rather indistinct, longer than the posterior cross-vein situated beyond it a distance twice the length of the latter; first submarginal cell scarcely longer than the second posterior cell, considerably narrower, its base lying a short distance beyond that of the latter; anterior branch of the fifth longitudinal vein as in the last species.

Hab.—Knapsack Gully, Blue Mountains; Hexham, and Wheeny Creek, N.S.W. (Skuse). October and January.

211. *CULEX* (? sp.)

| | | | |
|----------------------------|---------------|-----|-------------------|
| ♂.—Length of antennæ..... | 0·085 inch | ... | 2·14 millimètres. |
| Expansion of wings..... | 0·160 × 0·040 | ... | 4·06 × 1·01 |
| Size of body..... | 0·220 × 0·040 | ... | 5·58 × 1·01 |
| ♀.—Length of antennæ... .. | 0·100 inch | ... | 2·54 millimètres. |
| Expansion of wings..... | 0·180 × 0·045 | ... | 4·56 × 1·13 |
| Size of body..... | 0·220 × 0·047 | ... | 5·58 × 1·18 |

♂ and ♀.—Antennæ light brown; first joint of the scapus and basal half of the second joint ochre-yellow or ochraceous, in the ♂

more than $\frac{3}{4}$ the length of the palpi, the basal half of each of the first eleven flagellar joints whitish or yellowish; in the ♀ somewhat longer than the proboscis. Head brown or ochreous-brown (when denuded), densely covered with golden-yellow scales and hairs. Proboscis covered with brown or brownish-ochreous scales, violet-brown or violet-black at the base and towards the extremity; in the ♀ about seven times the length of the palpi. Palpi in the ♂ light ochreous-brown, the scales with a faint violaceous tinge, the fourth joint with a pale indistinct naked yellow ring at the base; in the ♀ uniformly covered with violet-black scales. Thorax generally ochreous- or testaceous-brown, sometimes darker (when denuded), densely covered with golden-yellow scales, indistinctly traversed by four very fine naked lines,* two median parallel ones terminating at an oblong bare space immediately in front of the scutellum, and two lateral curved lines, running straight from the scutellum to nearly the middle of the thorax then turning off to the lateral margin, these latter being frequently imperceptible; lateral margin and posterior portion of the thorax densely beset with long golden-yellow hairs; pleuræ more or less ochreous- or testaceous-brown, frequently very pale, sometimes reddish-brown, with a few small, and often indistinct, patches of white scales; scutellum ochre-yellow, or ochreous-brown, covered with golden-yellow scales and fringed with long golden-yellow hairs; metanotum ochreous or light brown. Halteres pallid or ochre-yellow, the club infuscated. Abdomen more than twice the length of the thorax in the ♂, shorter in the ♀; covered superiorly with violet-black or violet-brown scales, each segment bordered anteriorly with a narrow band of pale ochre-yellow; all the segments densely fringed posteriorly and beneath with golden-yellow hairs; venter covered with whitish or yellowish scales; ♂ forceps and ♀ ovipositor ochreous-yellow, densely haired. Legs covered with violet-brown scales, the femora with white scales

*These lines are often very difficult to make out except in fresh specimens, but their course can always be plainly seen on a perfectly denuded thorax when viewed in a certain light, being then represented by pale lines.

beneath and slightly at the base, the latter and the tibiæ very slightly tipped with ochreous at the apex (almost imperceptibly in most specimens); tibiæ and tarsi with a pale ochreous reflection beneath. Coxæ yellow or brownish-yellow, with white scales. Wings longer than the abdomen, hyaline, the veins densely covered with violet-brown scales. Auxiliary vein joining the costa immediately opposite the tip of the posterior branch of the fork of the fifth longitudinal vein; middle cross-vein about equal in length to the posterior cross-vein, situated in front of the latter a distance equal to twice its length; first sub-marginal cell longer and somewhat narrower than the second posterior cell, its base situated opposite that of the latter in the ♂, slightly before it in the ♀; anterior branch of the fifth longitudinal vein originating opposite a point rather nearer the origin of the second longitudinal than to the tip of the sixth longitudinal.

Hab.—Widespread in Australia. Found in towns throughout the year, but more numerous and causing most annoyance during the summer months.

Obs.—Possibly a variety of *C. ciliaris*, Linn.

213. CULEX ATRIPES, sp.n. (W. Macleay, MSS.)

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♀.—Length of antennæ..... | 0·070 inch | ... | 1·77 millimètres. |
| Expanse of wings..... | 0·120 × 0·030 | ... | 3·04 × 0·76 |
| Size of body | 0·150 × 0·030 | ... | 3·81 × 0·76 |

Antennæ black, a little shorter than the proboscis; first joint of the scapus with a hoary reflection. Head densely covered with violet-black scales, the eyes bordered with a very fine line of silvery-white scales. Proboscis six times the length of the palpi, both uniformly covered with violet-black scales. Thorax (nitidous black when denuded), covered with light bronzy scales, and densely haired above the origin of the wings and posteriorly; prothoracic lobes and pleuræ, also an oblong spot just before the origin of the wings, covered with silvery-white scales; scutellum ochreous, covered above with violet-brown scales and fringed with long

hairs; metanotum reddish-brown. Halteres ochreous, the club and apical portion of the stem more or less brown. Abdomen about twice the length of the thorax, uniformly clothed superiorly with violet-black scales, each segment with a white patch at the sides; venter densely covered with silvery-white scales. Legs covered with violet-black scales, the coxæ more or less covered with silvery-white scales and the femora dusted on their basal half with pale scales which have a light bronzy reflection in a certain light. In the hind-legs the metatarsus nearly $\frac{1}{7}$ longer than the tibia. Wings longer than the abdomen, pellucid, almost hyaline, with an almost imperceptible brownish tint, the veins thickly covered with violet-black scales; violaceous and purpureous reflections. Auxiliary vein joining the costa opposite a point about mid-way between the middle and posterior cross-vein, and considerably before the tip of the posterior branch of the fifth longitudinal vein; middle cross-vein considerably shorter than the posterior cross-vein, and situated beyond it a distance equal to about twice the length of the latter; first sub-marginal cell much longer and scarcely narrower than the second posterior cell, its base lying somewhat before that of the latter; anterior branch of the fifth longitudinal vein originating opposite a point about mid-way between the origin of the second longitudinal and the tip of the sixth longitudinal.

Hab.—Homebush (Masters); Sutherland, and Knapsack Gully, N.S.W. (Skuse).

Obs.—A ♂ specimen taken by me at Mossman's Bay, near Sydney, appears to belong to this species; the femora and tibiæ are tipped with white scales, and the tarsi exhibit light reflections when viewed at a certain obliquity.

Genus 3. ANOPHELES, Meig.

Anopheles, Meigen, Syst. Besch. I. 1818, p. 10; Brit. Ent. Vol. V. 1828, p. 210; Macquart, S. à B. Vol. I. 1834, p. 32; Zetterstedt, D. Sc. 1850; Walker, I. B. Vol. III. 1856, p. 248; Schiner, F. A. 1864.

Head small, sub-globose, situated moderately deep in the thorax. Eyes reniform, emarginate at the insertion of the antennæ, slightly separated on the front. Ocelli wanting. Palpi porrected, clothed with scales, almost the length of the proboscis in both sexes, five-jointed, first joint minute, second long and slender, third about twice the length of the second, fourth and fifth joints taken together about equal in length to the second, forming an elongated club in the ♂. Proboscis long, slender, densely clothed with scales, straight or bent downwards. Antennæ porrected, a little shorter than the palpi in both sexes, 2- + 12-jointed; first joint of the scapus large and globose, second in the ♂ rather longer and stouter than the first flagellar joint, in the ♀ about twice the length and somewhat stouter than the first flagellar joint, cylindrical; in the ♂ the ten following flagellar joints short, fusiform, whorled at the middle with very long hairs, the penultimate joint greatly elongated beyond the whorl, terminal joint shorter, slender, like the continuation of the last, with a few moderately long hairs forming a verticil at the base, both clothed with a short pubescence; in the ♀ all the flagellar joints cylindrical, of equal thickness, the first shorter than the rest, clothed with a dense minute pubescence and sparsely verticillate-pilose at the base. Clypeus produced, covering the base of the palpi. Thorax oblong, little arched; scutellum small; metathorax steep. Abdomen slender, linear, with eight segments in both sexes; in the ♂ terminating with holding-forceps; the ovipositor of the ♀ with short terminal lamellæ. Legs very long and slender, the fore-pair the shortest; very minutely spinulose; metatarsal joint very long, in the hind-legs longer than the tibiæ; unguis small, acute. Wings as long or longer than the abdomen, sub-elliptic, densely ciliated, the veins very densely covered with slender, lanceolate scales; incumbent in repose. Humeral cross-vein and sub-costal cross-vein present, the latter situated at or beyond the middle of the auxiliary vein. Marginal cross-vein present, the second longitudinal vein appearing before it in the first basal cell as a short piece of scaled vein not continued to the base of the

wing as an incassation of a wing-fold. Second longitudinal vein terminating in a very long narrow fork, the branches running parallel. Third longitudinal vein not starting from the second longitudinal vein, joined to it by a supernumerary cross-vein, appearing to originate in the first basal cell almost opposite the tip of the sixth longitudinal vein, scaled between this point and the supernumerary cross-vein, and continued back to the base of the wing as an incassation of a wing-fold; middle cross-vein situated in advance of the supernumerary cross-vein; fourth longitudinal vein terminating in a broader and shorter fork than that of the second longitudinal vein, their bases more or less opposite. Posterior cross-vein situated before or in a line with the middle cross-vein. Fork of the fifth longitudinal vein broad, longer than that of the second longitudinal vein, its base situated opposite the origin of the latter vein. Sixth longitudinal vein only slightly arcuated, joining the wing-margin opposite or beyond the posterior cross-vein (Pl. XL, fig. 3).

214. ANOPHELES ANNULIPES, Walker.

Anopheles annulipes, Walk., Insecta Saundersiana, Vol. I. Diptera, 1856, p. 433.

“♀.—*Fusco gracillima, cano tomentosa; proboscis ex parte testacea; palpi albidii, fusco fasciati; thorax subvittatus; pedes longissimi, gracillimi, femoribus tibiisque albido fasciatis, femoribus basi testaceis, tarsis fascia alba, posticis longissimis; alæ subcineræ, venis fuscis dense ciliatis albido fasciatis, costa nigricante maculis tribus albidis; halteres albidii.*”

“Brown, very slender, with hoary tomentum. Proboscis partly testaceous, rather longer than palpi. Palpi whitish, with brown bands, longer than the antennæ. Thorax indistinctly striped. Legs very long and slender; femora and tibiæ with numerous whitish bands; femora testaceous towards the base; tarsi with a white band; hind tarsi extremely long. Wings slightly greyish; veins brown, with whitish bands, thickly ciliated; costa blackish,

with three oblong whitish spots. Halteres whitish. Length of body $3-3\frac{1}{2}$ lines; of the wings 6-7 lines."

"Van Diemen's Land."

215. ANOPHELES MUSIVUS, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♀.—Length of antennæ..... | 0·080 inch | ... | 2·02 millimètres. |
| Expand of wings..... | 0·200 × 0·050 | ... | 5·08 × 1·27 |
| Size of body..... | 0·230 × 0·040 | ... | 5·84 × 1·01 |

Antennæ brown, the joints with a white pubescence and verticils, and the second joint of the scapus and following three or four flagellar joints with white scales; about $\frac{2}{3}$ the length of the palpi; first joint of the scapus brownish-ochreous. Head brown, with white scales on the vertex, from which some long white hairs stretch out over the front. Proboscis brown, equal in length to the palpi. Palpi covered with violet-black scales, second joint with a slight ring of white scales at the apex, last three joints with a broad ring of white at the apex, and the second and third joints with a longitudinal patch of white above, in the second about the middle, in the third on the first third of its length. Thorax fuscous-brown, with a slaty-grey reflection, imperfectly covered with white scales, beset laterally and posteriorly with yellow hairs; pleuræ fuscous-brown; scutellum fuscous, ochreous at the sides, densely fringed with long yellow hairs; metanotum fuscous. Halteres deep fuscous, the stem yellow. Abdomen rather more than twice the length of the thorax, fuscous-brown, levigate, rather densely covered with yellow hairs, the last segment with some yellow scales; lamellæ of the ovipositor deep fuscous-brown. Legs covered with violet-black scales, the femora and tibiæ and sometimes the metatarsus spotted with small patches of whitish or pale yellow scales, the tibiæ and first four joints of the tarsi also very slightly tipped with whitish or pale yellow. Coxæ ochreous-grey, sprinkled with white scales and yellow hairs. In the hind-legs the metatarsus a little longer than the tibia. Wings the length of the thorax and abdomen taken together, hyaline, slightly tinged with brown at

the stigmatic region, the veins very densely covered alternately with patches of violet-brown and whitish or pale yellow scales, four long patches of very deep violet-brown, almost black, scales occurring along the costal vein. Sub-costal cross-vein situated at the middle of the auxiliary vein. Auxiliary vein reaching the costa considerably before the tip of the posterior branch of the fork of the fifth longitudinal vein; second longitudinal vein beginning a very short distance before the marginal cross-vein (almost imperceptibly in one specimen); third longitudinal vein appearing to commence in the fifth basal cell a short distance before the supernumerary cross-vein, and almost opposite the tip of the sixth longitudinal vein; middle cross-vein in advance of the supernumerary cross-vein a distance equal to half its length; posterior cross-vein opposite the tip of the sixth longitudinal vein and situated before the middle cross-vein a distance equal to its length; all three cross-veins of about equal length; first sub-marginal cell considerably longer and somewhat narrower than the second posterior cell, its base situated a little before that of the latter; base of the anal cell lying almost opposite but somewhat before the origin of the second longitudinal vein.

Hab.—Elizabeth Bay, near Sydney (Masters and Skuse); Mt. Kembla, Illawarra, N.S.W. (Mr. A. G. Hamilton). Feb.

216. ANOPHELES ATRATIPES, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♀.—Length of antennæ..... | 0·070 inch | ... | 1·77 millimètres. |
| Expanse of wings..... | 0·165 × 0·033 | .. | 4·18 × 0·84 |
| Size of body..... | 0·165 × 0·030 | ... | 4·18 × 0·76 |

Antennæ about $\frac{3}{4}$ the length of the palpi, dark brown almost fuliginous, with hoary pubescence and verticils, the first joint of the scapus black. Head fuliginous, adorned with white scales intermixed with some black hairs, and a tuft of long white parallel hairs stretching out from the vertex over the bases of the antennæ. Proboscis and palpi densely and uniformly clothed with deep violet-black scales, the terminal joint of

the latter very slightly tipped with white. Thorax pruinose-brown, with a small roundish dark spot laterally about the middle of its length and another immediately in front of the scutellum; traversed by three longitudinal parallel double rows of moderately long black hairs intermixed with short slender shining white scales; lateral margins slightly testaceous with a few scattered white scales and some short white hairs above and in front of the origin of the wings; pleuræ dark brown somewhat marbled with testaceous; scutellum testaceous, with a dark roundish spot on the apex, fringed with long black hairs; metanotum brown. Halteres black or very deep brown, the stem ochre-yellow. Abdomen about twice the length of the thorax, black, levigate, sparingly clothed with golden-yellow hairs (the terminal joint more densely); lamellæ of the ovipositor black, fringed with short golden-yellow hairs. Coxæ ochreous. Legs clothed with violet-black scales, the femora and tibiæ bright ochreous beneath and very slightly at the tips. Coxæ pale ochreous, without scales, slightly haired. Wings the length of the entire body, bright ochre-yellow at the base, hyaline, the veins very densely covered with scales, those on the costa, auxiliary and first longitudinal veins black, the remaining veins with black and yellowish scales arranged in alternate series, almost entirely black on the sixth longitudinal vein; six patches of black scales are prominent, situated at the following points:—on the fifth longitudinal vein mid-way between its origin and the base of its fork, at the base of the fork, at the bases of the second and third longitudinal veins, and at the bases of the forks of the second and fourth longitudinal veins; the cilia on the costa between a point immediately above the tip of the first longitudinal vein and immediately below the tip of the third longitudinal vein pale yellowish or whitish, the remaining cilia violet-black with a light sericeous reflection. Auxiliary vein reaching the costa opposite the middle cross-vein; second longitudinal vein beginning some distance before the marginal cross-vein; supernumerary and middle cross-vein opposite one another, situated beyond the posterior cross-vein a distance

not equal to the length of the latter ; posterior cross-vein situated opposite the beginning of the third longitudinal vein, and considerably beyond the tip of the sixth longitudinal vein ; first sub-marginal cell longer but not narrower than the second posterior cell, its base situated a little before that of the latter ; base of the anal cell lying a little before the origin of the second longitudinal vein.

Hab.—Berowra, N.S.W. (Skuse). January.

217. ANOPHELES MASTERSI, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♂.—Length of antennæ..... | 0·075 inch | ... | 1·89 millimètres. |
| Expanses of wings..... | 0·140 × 0·030 | ... | 3·55 × 0·76 |
| Size of body..... | 0·170 × 0·025 | ... | 4·31 × 0·62 |
| ♀.—Length of antennæ..... | 0·060 inch | ... | 1·54 millimètres. |
| Expanses of wings..... | 0·150 × 0·030 | ... | 3·81 × 0·76 |
| Size of body..... | 0·130 × 0·025 | ... | 3·30 × 0·62 |

Very like *A. musivus* produced on a smaller scale. Antennæ in the ♂ about $\frac{3}{4}$ the length of the palpi, very pale ochreous, the verticils sericeous ; first joint of the scapus light testaceous-brown ; in the ♀ about $\frac{4}{5}$ the length of the palpi, dark brown, with the pubescence and verticils of the joints white, and the first two or three flagellar joints covered with white scales. Head brown, with white scales on the vertex, from which long white hairs project out over the front. Proboscis about the length of the palpi ; in the ♂ entirely brown, in the ♀ with the basal half dark brown and the apical half pale ochreous. Palpi brown, the second joint very slightly tipped with white, and the last three joints with a very broad ring of white on the apical portion, nearly covering the whole joint in the last two ; in the ♂ the second and third joints also with a short longitudinal streak of white on the upper side. Thorax in the ♂ fuscous-brown, in the ♀ somewhat ochreous-brown ; imperfectly covered with white or yellow scales and yellow hairs ; pleurae and metanotum fuscous-brown ; scutellum fuscous, sordid-ochreous at the sides, thickly fringed with long

yellow hairs. Halteres deep fuscous, the stem yellow. Abdomen in the ♂ more than twice the length of the thorax, shorter in the ♀; fuscous-brown, levigate, densely clothed with golden-yellow hairs, (longer in the ♂); the last segment, and holding-forceps of the ♂, ornamented with white scales. Legs covered with violet-brown scales, the femora, tibiæ and metatarsus numerously spotted with very small patches of white or pale yellow, the tibiæ and first four joints of the tarsi also slightly tipped with the same. In the hind-legs the metatarsus a little longer than the tibia. Wings about the length of the abdomen in the ♂, longer than the whole body in the ♀, hyaline, slightly tinged with very pale brownish-yellow at the stigmatic region, the veins very densely covered with alternate series of violet-brown and whitish or pale yellow scales, four long patches of very deep violet-brown, almost black, scales occurring along the costal vein. Sub-costal cross-vein situated considerably beyond the auxiliary vein. Auxiliary vein reaching the costa considerably before the tip of the posterior branch of the fork of the fifth longitudinal vein; third longitudinal vein appearing to commence a short distance before the supernumerary cross-vein, opposite the posterior cross-vein and somewhat before the tip of the sixth longitudinal vein; supernumerary, middle and posterior cross-veins about equal in length, most indistinct in some specimens; middle cross-vein situated in advance of the supernumerary cross-vein a distance equal to half its length; posterior cross-vein situated before the middle cross-vein a distance equal to its length; first sub-marginal cell considerably longer and somewhat narrower than the second posterior cell, its base situated somewhat before that of the latter; base of the anal cell situated opposite the origin of the second longitudinal vein.

Hab.—Blue Mountains, N.S.W. (Masters). Three specimens.

218. *ANOPHELES STIGMATICUS*, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♂.—Length of antennæ..... | 0.080 inch | ... | 2.02 millimètres. |
| Expanse of wings..... | 0.160 × 0.035 | ... | 4.06 × 0.88 |
| Size of body..... | 0.180 × 0.030 | ... | 4.56 × 0.76 |

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♀.—Length of antennæ..... | 0·070 inch | ... | 1·77 millimètres. |
| Expand of wings..... | 0·160 × 0·035 | ... | 4·06 × 0·88 |
| Size of body..... | 0·160 × 0·030 | ... | 4·06 × 0·76 |

♂ and ♀.—Antennæ in the ♂ about $\frac{5}{6}$ the length of the palpi, brownish-ochreous; first joint of the scapus black or dark brown; in the ♀ about $\frac{4}{5}$ the length of the palpi, dark brown with a whitish pubescence and brown verticils; first joint of the scapus and basal half of the second testaceous-brown. Head ochraceous-brown, with golden-yellow hairs. Proboscis scarcely longer than the palpi, brown, almost black in the ♀. Palpi brown, almost black in the ♀. Thorax testaceous-brown, darker in the ♀, with three longitudinal double rows of pale golden-yellow hairs; lateral borders rather densely covered with pale golden-yellow hairs; pleuræ testaceous-brown in the ♂, fuscous in the ♀; scutellum ochre-yellow in the ♂, testaceous in the ♀, fringed with long golden-yellow hairs; metanotum testaceous in the ♂, very deep fuscous-brown in the ♀. Halteres deep brown, the stem yellow. Abdomen in the ♂ twice the length of the thorax, shorter in the ♀; fuliginous-brown, levigate, clothed with golden-yellow hairs; ♂ forceps testaceous, densely haired. Legs clothed with violet-brown scales, the hind femora pale yellow for about $\frac{1}{3}$ of their length, the fore and intermediate pairs pale yellow beneath only. Coxæ ochreous- or testaceous-brown. In the hind-legs the metatarsus about $\frac{1}{2}$ longer than the tibia. Wings in the ♂ the length of the thorax and abdomen taken together, and in the ♀ the length of the whole body, hyaline, tinged with pale yellowish-brown at the stigmatic region, the veins thickly covered with light brown scales, darker at the stigmatic region. Sub-costal cross-vein situated about the middle of the auxiliary vein. Auxiliary vein reaching the costa about opposite the middle cross-vein, and considerably before the tip of the posterior branch of the fifth longitudinal vein; second longitudinal vein appearing to originate in the first basal cell opposite the base of the anal cell and some distance before the marginal cross-vein; third longitudinal vein appearing to commence a short distance before the supernumerary cross-vein

and before the tip of the sixth longitudinal vein; middle cross-vein in the ♂ situated somewhat before or exactly in line with the posterior cross-vein, in the ♀ beyond the latter a distance equal to its length, always situated beyond the supernumerary cross-vein a distance equal to its length; all about the same length; first sub-marginal cell considerably longer and narrower than the second posterior cell, the tips of the fork slightly convergent, its base situated opposite that of the second posterior cell.

Hab.—Blue Mountains, N.S.W. (Masters). Ten specimens.

Genus 4. *ÆDES*, Meig.

Ædes, Meigen, Syst. Besch. Vol. I. 1818, p. 13; Macquart, S. à B. Vol. I. 1834, p. 37; Zetterstedt, D.Sc. 1850; Walker, I.B. iii. 1856; Schiner, F.A. II. 1864.

“Antennæ porrected, filiform, 14-jointed, plumose in the ♂, pilose in the ♀. Proboscis porrected, the length of the thorax. Palpi very short. Wings scaly, incumbent.”

Obs.—This is all the information about the genus given by Meigen (Syst. Besch. I.), while Macquart simply says, “Palpi very short ♂, ♀ pointed, thick at the base.” From the single ♀ specimen before me I derive the following additional characters, all of which have perhaps been already pointed out by modern Dipterologists, but whose works are not available in Australia.

Head small, sub-globose, scarcely sunk in the thorax. Eyes reniform, a little emarginate at the insertion of the antennæ, not quite contiguous on the front. Ocelli wanting. Palpi very short, densely scaled, 4-jointed;* first two joints minute, the second larger than the first, third joint short, obovate, fourth joint about one third longer than the third, almost elliptical. Proboscis slender, densely scaled. Antennæ porrected, considerably shorter than the proboscis, 2- + 12-jointed; first joint of the scapus large, globose, second pyriform, somewhat wider and about $\frac{1}{3}$ longer

* Should there be a minute terminal joint it is hidden in the scales, but to ascertain whether this be so the specimen might be sacrificed in the attempt.

than the flagellar joints, both densely scaled; flagellar joints short, cylindrical, verticillate-pilose at the base, separated by short pedicels, the terminal joint longer than the rest, coniform. Thorax oblong, arched; prothoracic lobe scarcely noticeable; scutellum small; metathorax steep. Halteres small. Abdomen almost cylindrical, tapering towards the extremity, with eight segments. Legs long, slender, the fore pair the shortest; minutely spinulose; metatarsal joint very long, in the hind-legs longer than the tibiæ; ungues small, acute. Wings longer than the abdomen, narrow, elongate, densely ciliated, the veins very densely covered with more or less elliptical scales which completely cover the wings; incumbent in repose. Humeral cross-vein and sub-costal cross-vein present, the latter situated much before the middle of the auxiliary vein. Marginal cross-vein wanting. Second longitudinal vein starting from the first longitudinal vein a short distance beyond the sub-costal cross-vein, terminating in a long narrow fork the branches of which run parallel. Third longitudinal vein bent sharply downwards at its base then running perfectly straight to the apex of the wing, originating at a point a little nearer to the base of the fork of the second longitudinal than to the origin of the latter. Middle cross-vein situated close to the base of the third longitudinal vein. Fourth longitudinal vein terminating in a fork about equal in width and length to that of the second longitudinal vein, its base lying before that of the latter. Posterior cross-vein situated before the middle cross-vein and about opposite the tip of the sixth longitudinal vein (Pl. XL., fig. 4).

218. *ÆDES VENUSTIPES*, sp.n.

| | | | |
|---------------------------|---------------|-----|-------------------|
| ♀.—Length of antennæ..... | 0·045 inch | ... | 1·13 millimètres. |
| Expansé of wings..... | 0·120 × 0·035 | ... | 3·04 × 0·88 |
| Size of body | 0·150 × 0·030 | ... | 3·81 × 0·76 |

Antennæ deep brown, about $\frac{2}{3}$ the length of the proboscis, covered with a very short hoary pubescence; verticils moderately

long, brown ; both joints of the scapus covered with brown and white scales, those of the second overlapping the basal half of the third joint, so that these two appear to be one long robust joint. Head with a large patch of erect yellowish scales, covering the front, and surrounded laterally and behind with brown scales and some long brown hairs ; some white scales on the hinder border of the eyes. Proboscis deep brown, somewhat spotted with white scales, with a ring of white in the middle and another rather broader one immediately before the terminal lobes. Palpi rather more than $\frac{1}{2}$ the length of the proboscis, deep brown, the third joint dusted with white scales and the last joint with a few white scales at the extreme apex. Thorax deep brown, densely covered with a mixture of brown and yellowish scales, interspersed with tolerably long brown hairs, three oblong patches of the yellowish scales arranged in a triangle, rather distinctly visible on the anterior portion of the thorax, the apical patch beginning below the anterior border, and the bases of the lower patches reaching a little below the middle of the thorax ; pleuræ deep brown with irregularly dispersed white scales ; scutellum testaceous, with yellowish and brown scales and brown hairs ; metanotum deep brown. Halteres deep brown, the stem testaceous. Abdomen about the width and twice the length of the thorax, almost umber-brown where denuded, very densely clothed with brown and white scales, the latter predominating at the sides of the segments and underneath ; segments fringed with long yellowish hairs. Legs slender. Coxæ deep brown, with white scales. Femora, tibiæ, and tarsi brown, thickly covered with very small white rings and spots, except that in the tarsi of the hind legs the whole of the third, and most of the fourth joint (except at the apex), purely white. In the hind-legs the tibiæ $\frac{3}{4}$ the length of the metatarsus. Wings the length of the abdomen, hyaline, all the veins thickly beset with somewhat broad, more or less elliptical,* brown and yellowish

* I have only seen the wing-scales of this shape in the present species ; it may be a peculiarity of the genus ; those of *Megarrhina* are more or less turbinate, whilst in *Culex* and *Anopheles* they are long and very slender.

scales, chiefly the former, which almost completely cover the wings; veins pale; cilia brownish-grey; purpureous and azure reflections. Auxiliary vein joining the costa almost opposite but somewhat before the base of the first sub-marginal cell; sub-costal cross-vein situated not far before the origin of the second longitudinal vein; middle cross-vein same length as the posterior cross-vein, situated considerably beyond the latter, and about opposite the middle of the posterior branch of the fifth longitudinal vein; anterior branch of the fifth longitudinal vein issuing at a point somewhat nearer opposite to the origin of the second longitudinal than to the tip of the sixth longitudinal; the latter situated opposite the posterior cross-vein; second posterior cell about same width as, but scarcely shorter than, the first sub-marginal cell, its base lying before that of the latter.

Hab.—Elizabeth Bay, near Sydney (Skuse). One specimen.

EXPLANATION OF PLATE.

PLATE XL.

- Fig. 1. Venation in wing of *Megarrhina*.
 Fig. 2. „ „ „ „ *Culex*.
 Fig. 3. „ „ „ „ *Anopheles*.
 Fig. 4. „ „ „ „ *Edes*.
 Fig. 5. Diagram illustrating the terminology for the veins and cells as applied to the Culicidæ.

Veins.

- Costa (*v. costalis*). a, g.
 Transverse shoulder-vein (*v. trans. humeralis*). b.
 Auxiliary (*v. auxiliaris*). c.
 Sub-costal cross-vein (*v. trans. subcostalis*). p.
 1st longitudinal (*v. long. 1ma*). d.
 Marginal cross-vein (*v. trans. marginalis*). q.
 2nd longitudinal (*v. long. 2da*). s, e, f.
 Anterior branch (*v. long. 2da ramus anterior*). e.

Veins—continued :

- Supernumerary cross-vein. r.
 3rd longitudinal (*v. long. 3a*). t, g.
 Middle cross-vein (*v. trans. media*). y.
 4th longitudinal (*v. long. 4a*). x, h, k.
 Anterior branch (*v. long. 4a ramus anterior*). h.
 Posterior cross-vein (*v. trans. posterior*). z.
 5th longitudinal (*v. long. 5a*). x, l, m.
 Anterior branch (*v. long. 5a ramus anterior*). l.
 Incrassation of wing-fold. u, v.
 6th longitudinal (*v. long. 6a*). n.

Cells.

- Costal (*c. costalis*). A.
 Sub-costal (*c. subcostalis*). B.
 Marginal (*c. marginalis*). C.
 1st sub-marginal (*c. submarginalis 1ma*). D.
 2nd sub-marginal (*c. submarginalis 2da*). E.
 1st posterior (*c. posterior 1ma*). F.
 2nd posterior (*c. posterior 2da*). G.
 3rd posterior (*c. posterior 3a*). H.
 1st basal (*c. basalis 1ma*). I.
 2nd basal (*c. basalis 2da*). J.
 Anal (*c. analis*). K.
 Axillary (*c. axillaris*). L.
 Spurious, M.

